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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/578,228	05/24/2000	Robert L. Heimann	EL017RH-2	4626

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EXAMINER	
MULLINS, BURTON S	
ART UNIT	PAPER NUMBER
2834	

DATE MAILED: 02/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/578,228	HEIMANN ET AL.	
	Examiner	Art Unit	
	Burton S. Mullins	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 May 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *20-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *20-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Information Disclosure Statement

1. Applicant requests consideration of US Patent No. 6,455,100, including references cited therein. However, the examiner notes that an information disclosure statement complying with 37 CFR 1.98(a)(1), which requires a list of all patents, publications, or other information submitted for consideration by the Office, has not been filed. To speed prosecution, the examiner will consider the US and foreign references cited in US '100. Copies of the non-patent literature cited in US '100 are not available for consideration at this time. If applicant wishes these references to appear on the front of any patent issuing from this application, he should provide an IDS list per 37 CFR 1.98(a)(1) above.

Claim Rejections - 35 USC § 112

2. Claims 33-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 36, functional recitation "wherein the treated surface...reacts with molten aluminum" is vague. Does this refer to a general chemical reaction or a metallurgic reaction?

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 20-29 and 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fahy (US 5,488,984) in view of Parkinson (US 3,839,256). Fahy generally teaches a method for manufacturing squirrel-cage rotors including treating high-permeability steel core laminations 5 with a solution including sodium nitrite, and injecting molten aluminum in defined openings therein (notches 9) to produce rotor bars 15 and end rings 17 (c.3, lines 19-25; Figs.1-2). The solution prevents soldering of the aluminum to the steel (abstract). Fahy does not teach a coating "comprising at least one silicate and silica and having a basic pH."

Parkinson teaches an electrical insulation coating composition for magnetic cores comprising: a coating composition comprising at least one silica containing composition (e.g., sodium silicate, c.2, lines 50-53, Example 6) having at least one silicate and silica and having a basic pH (sodium silicate has basic pH). Among other advantages, Parkinson's coating provides good insulation characteristics and improved handling during manufacture since the coating is not acidic and corrosive (c.2, line 52-c.3, line 10).

It would have been obvious to one of ordinary skill at the time of the invention to modify Fahy and provide a silicate/silica solution with basic pH per Parkinson since this would have been desirable to provide good insulation characteristics to the laminations and improve handling thereof during rotor manufacture.

Regarding claim 21, the aluminum bars 15 and end rings 17 in Fahy partially encapsulate the rotor laminations.

Regarding claims 22-24, the coating separates and electrically insulates the laminations from the molded aluminum in Fahy and Parkinson.

Regarding claim 26, Parkinson teaches polymers (c.7, lines 17-25).

Regarding claim 28, note that Parkinson teaches that sodium silicate may be substituted (c.2, lines 50-53, Example 6).

Regarding claim 33 and the functional language "wherein the treated surface electrically insulates the component from and reacts with molten aluminum that at least partially embeds said component", Fahy's Nitrisol B coating inherently insulates the laminations and Parkinson teaches that the coating insulates the sheets (abstract, lines 6-7). Further, the coating of Fahy and Parkinson inherently "reacts with" the aluminum since the composition, in particular Fahy's, prevents the aluminum from contacting or soldering to the underlying metal containing surface (c.3, lines 38-42). In Parkinson, the coating's ethylene copolymers are described as providing "excellent adhesion to metal surfaces and...reacted or cross-linked under certain conditions" (c.2, lines 58-64). Such metal surfaces would include the embedded aluminum.

Regarding claim 34, Parkinson teaches sodium silicate (c.2, lines 50-53, Example 6).

Regarding claim 35, Parkinson and Fahy both teach insulative coatings. While they do not explicitly state that the coating provides the surface with a resistivity of greater than 1.0 milli-ohm, optimization of ranges for the resistivity would have involved ordinary skill since it has been held that where the general conditions of a claim are met, discovering optimum or workable ranges involves routine skill. In re Aller, 105 USPQ 233.

5. Claims 20-27, 29 and 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fahy (US 5,488,984) in view of Heimann (US 5,714,093). Fahy generally teaches a method for manufacturing squirrel-cage rotors including treating high-permeability steel core laminations 5 with a solution including sodium nitrite, and injecting molten aluminum therein

to produce rotor bars 15 and end rings 17 (c.3, lines 19-25; Figs.1-2). The solution prevents soldering of the aluminum to the steel (abstract). Fahy does not teach a coating "comprising at least one silicate and silica and having a basic pH."

Heimann teaches a gel coating for inhibiting corrosion of ferrous metals comprising a base made of, among others, silicate esters (c.14, lines 48-49) and further including a thickener such as silica (c.14, line 59), or additives including silica for tailoring thermal resistance (c.15, lines 48-56). Heimann further teaches: "The gel includes buffers in sufficient quantity to enable the gel to buffer pH in the range in which the metal to be corrosion-protected is naturally passive to corrosion. For protecting steel, iron or iron alloy, a gel comprising a polyalphaolefin (1-decene) base and about 10% by volume sodium silicate, about 10% by volume potassium silicate and about 10% by volume zinc borate has been found very effective. Such a composition, when applied to the steel, iron or iron alloy surface, provides a pH buffer for the metal in the pH range between 8-13" (c.14, lines 6-15).

It would have been obvious to one of ordinary skill at the time of the invention to modify Fahy and provide a silicate/silica coating with basic pH per Heimann since this would have been desirable to prevent or retard corrosion of the metal laminations.

Regarding claim 21, the aluminum bars 15 and end rings 17 in Fahy partially encapsulate the rotor laminations.

Regarding claims 22-24, as best understood, the coating separates and electrically insulates the laminations from the molded aluminum in Fahy and Heimann.

Regarding claim 26, Heimann teaches polymers (c.14, lines 16-50).

Regarding claim 31, silica additives in Heimann (c.15, line 51) would include silicon carbide and silicon nitride.

Regarding claim 32, note acrylics and urethanes in Heimann (c.15, lines 3-15).

6. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fahy and either Parkinson or Heimann as applied to claim 25 above, and further in view of Takimoto et al. (US 5,298,059). Fahy and Parkinson or Heimann do not appear to teach ferromagnetic particle additives.

Takimoto teaches a silicate coating composition for rust prevention in steel plates (c.1, lines 20-24; c.5, lines 65-c.6, line 2) including ferromagnetic pigments such as iron oxides (c.4, lines 58-59).

It would have been obvious to one of ordinary skill at the time of the invention to modify Fahy and either Parkinson or Heimann and provide ferromagnetic additives per Takimoto since pigments would have been desirable to impart color to the coating.

7. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fahy and Parkinson as applied to claim 25 above, and further in view of Ettinger et al. (US 4,479,104). Fahy and Parkinson do not appear teach any of the additives in claim 31, e.g., silicon carbide, carbon, etc.

However, Ettinger teaches that it is well known to employ semi-conductive particles such as powdered silicon carbide in insulating enamel coatings for transformer cores, depending upon the degree of conductivity required at the impulse voltage (c.2, lines 27-46).

It would have been obvious to one of ordinary skill at the time of the invention to modify Fahy and Parkinson and provide a silicon carbide additive in the coating per Ettinger

since such a semi-conductive compound would have been desirable for providing the degree of conductivity required at the impulse voltage.

8. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fahy and Parkinson as applied to claim 33 above, and further in view of Takimoto et al. (US 5,298,059). Fahy and Parkinson do not appear to teach ferromagnetic particle additives.

Takimoto teaches a silicate coating composition for rust prevention in steel plates (c.1, lines 20-24; c.5, lines 65-c.6, line 2) including ferromagnetic pigments such as iron oxides (c.4, lines 58-59).

It would have been obvious to one of ordinary skill at the time of the invention to modify Fahy and Parkinson and provide ferromagnetic additives per Takimoto since pigments would have been desirable to impart color to the coating.

9. Claims 20-25, 27, 33 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fahy (US 5,488,984) in view of JP Published Application 4-165082 and van Ooij et al. (US 5,108,793). Fahy teaches an electric motor rotor lamination treatment and manufacturing method including a squirrel-cage rotor assembly 1 comprising core 3 made of plural laminations 5 of high-magnetic permeability sheet steel (Figs.1-2). The core is placed in a mold and molten aluminum contacts the lamination slots 13 to form bars 15 and end rings 17.

Fahy teaches a Nitrosol B coating for the laminations which prevents rotor soldering, but does not disclose a coating for the laminations: 1) "comprising at least one silicate and silica;" and 2) "having a basic pH."

Regarding (1), JP Published Application 4-165082 (JP '082) teaches an insulating film used for iron cores of transformers obtained by contacting the hot-rolled steel transformer

laminates with a coating composition comprising colloidal silica (up to 50 nm particle size) and further including 0.5-25 pts.wt. of 5-2000 nm size non-colloidal solid including silicate (abstract). The film is useful for giving good magnetic characteristics to the transformer cores (abstract).

Regarding (2), Van Ooij teaches a silicate coating for sheet steel to protect against corrosion (c.1, lines 6-12). The sheet is rinsed in a waterglass solution of silicate at basic pH levels (e.g., a pH of 12 in Example 1). The basic pH controls the rate of reaction for forming the silicate coating in a reasonable period of time. At a pH less than 10, the rate is too slow. At a pH greater than 12, the rate is not appreciably increased. See c.4, lines 32-43.

It would have been obvious to one having ordinary skill in the art at the time of the invention to provide Fahy's motor laminations with: 1) a coating comprising a silicate and a silica per JP '082 since this would have been desirable to give good magnetic characteristics to the core; and 2) a basic pH per van Ooij since this would have been desirable to provide a rate of reaction for forming the coating in a reasonable period of time. Regarding claims 22-24, the coating of JP '082 and van Ooij as applied to Fahy inherently performs the functions of isolating and electrically insulating the substrate from the metal molding, as well as providing a "barrier" between the substrate and the metal molding.

Regarding claim 29, the coating of JP '02 and van Ooij as applied to Fahy would be inherently electrically resistive.

Regarding claim 33 and the functional language "wherein the treated surface electrically insulates the component from and reacts with molten aluminum that at least partially embeds said component", Fahy's Nitrisol B coating inherently insulates the

laminations and JP '082 teaches that the coating insulates the steel sheets (abstract). Further, the coating of Fahy, JP '082 and van Ooij would inherently "react with" the aluminum since the composition, in particular Fahy's, prevents the aluminum from contacting or soldering to the underlying metal containing surface (c.3, lines 38-42).

Regarding claim 35, Fahy and JP '02 teach insulative coatings. While they do not explicitly state that the coating provides the surface with a resistivity of greater than 1.0 milli-ohm, optimization of ranges for the resistivity would have involved ordinary skill since it has been held that where the general conditions of a claim are met, discovering optimum or workable ranges involves routine skill. In re Aller, 105 USPQ 233.

10. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fahy, JP '082 and van Ooij as applied to claim 25 above, and further in view of Miyosawa (US 4,016,129). Fahy, JP '082 and van Ooij do not teach a water-soluble polymer.

Miyosawa teaches a silica coating composition including an aqueous dispersion of silica-polyvinyl alcohol of variable viscosity for coating flexibility and continuity (c.3, lines 1-5) and a boric acid and tetraborate (c.7, lines 28-34) used as curing agents for the coating (c.5, lines 50-52).

It would have been obvious to one of ordinary skill at the time of the invention to modify Fahy, JP '082 and van Ooij and provide a water-soluble polymer per Miyosawa since these compounds would have been desirable for coating flexibility and as curing agents for the coating, respectively.

11. Claims 30 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fahy, JP '082 and van Ooij as applied to respective claims 25 and 33 above, and further in view of

Takimoto et al. (US 5,298,059). Fahy, JP '082 and van Ooij do not teach ferromagnetic particle additives.

Takimoto teaches a silicate coating composition for rust prevention in steel plates (c.1, lines 20-24; c.5, lines 65-c.6, line 2) including ferromagnetic pigments such as iron oxides (c.4, lines 58-59).

It would have been obvious to one of ordinary skill at the time of the invention to modify Fahy, JP '082 and van Ooij and provide ferromagnetic additives per Takimoto since pigments would have been desirable to impart color to the coating.

12. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fahy, JP '082 and van Ooij as applied to claim 25 above, and further in view of Ettinger et al. (US 4,479,104). Fahy, JP '082 and van Ooij or Heimann do not teach any of the additives in claim 31, e.g., silcon carbide, carbon, etc.

However, Ettinger teaches that it is well known to employ semi-conductive particles such as powdered silicon carbide in insulating enamel coatings for transformer cores, depending upon the degree of conductivity required at the impulse voltage (c.2, lines 27-46).

It would have been obvious to one of ordinary skill at the time of the invention to modify Fahy, JP '082 and van Ooij and provide a silicon carbide additive in the coating per Ettinger since such a semi-conductive compound would have been desirable for providing the degree of conductivity required at the impulse voltage.

Response to Arguments

13. Applicant's arguments with respect to claims 20-31 have been considered but are not persuasive. In response to applicant's argument that there is no suggestion to combine Fahy and Parkinson, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Parkinson teaches a number of advantages his coating provides, including good insulation characteristics and improved handling during manufacture, since the coating is not acidic and corrosive (c.2, line 52-c.3, line 10). Both prior art references are in the field of applicant's endeavor of steel laminate coatings and thus reliance upon them as a basis for rejection of the claimed invention is proper. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992).

14. In response to applicant's argument that there is no suggestion to combine Fahy and Heimann, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Heimann teaches that: "The gel includes buffers in sufficient quantity to enable the gel to buffer pH in the range in which the metal to be corrosion-

protected is naturally passive to corrosion. *For protecting steel, iron or iron alloy*, a gel comprising a polyalphaolefin (1-decene) base and about 10% by volume sodium silicate, about 10% by volume potassium silicate and about 10% by volume zinc borate has been found very effective. Such a composition, when applied to the steel, iron or iron alloy surface, provides a pH buffer for the metal in the pH range between 8-13" (c.14, lines 6-15, emphasis added). Both prior art references are in the field of applicant's endeavor of steel laminate coatings and thus reliance upon them as a basis for rejection of the claimed invention is proper. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992).

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

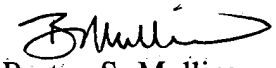
16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Burton S. Mullins whose telephone number is 305-7063. The examiner can normally be reached on Monday-Friday, 9 am to 5 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on 308-1371. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-0956.



Burton S. Mullins
Primary Examiner
Art Unit 2834

bsm
8-26-03